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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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EXAMINER

GRAHAM, ANDREW R

ART UNIT PAPER NUMBER

2644

DATE MAILED: 12/08/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

| | | |
|--------------------------------------|---------------------------------------|--|
| Application No. 09/471,706 | Applicant(s) SUZUKI, EIICHI | |
| Examiner Andrew Graham | Art Unit 2644 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____ .
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1, 2 and 4 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1, 2 and 4 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____ .
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) 8 .
- 4) Interview Summary (PTO-413) Paper No(s). _____ .
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____ .

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DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on September 10, 2003 was filed after the mailing date of the first office action on May 22, 2003. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement has been considered by the examiner.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1, 2, and 4** are rejected under 35 U.S.C. 103(a) as being unpatentable over Noro (USPN 4969195) in view of Bonneville (USPN 5729611).

Noro discloses an impedance compensation circuit for driving a speaker that includes the use of a positive feedback loop. Figure 1 presents a general arrangement of the circuit of the negative resistance driving system, which includes a positive feedback circuit (12), a feedback gain control means (6), and a comparison means (5), which collectively provide a feedback

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signal that is passed back through the speaker amplifier (11) of the invention through the use of an adder (13) (col. 3, lines 30-51). The overall device reads on "An audio apparatus for use in a negative impedance drive of a loudspeaker having an internal impedance to perform a desired amplifier-frequency characteristic". The amplifier (11) reads on "an amplifier device that drives the loudspeaker". The comparison means (5), which receives the signal sent across the speaker (3) and emits a signal to adjust the level of the feedback signal, reads on "a providing section that provides a control voltage corresponding to a level of the driving voltage of the loudspeaker". The amplifier (12) and the multiplier which receives the control signal from the comparison circuit (5) read on "a feedback device having a variable feedback gain that performs a positive feedback of a signal corresponding to the driving voltage of the loudspeaker to an input of the amplifier device". The inputs and operations of these two components (12,13) reads on "receiving the signal corresponding to the driving voltage" and "responsive to the control voltage and the signal corresponding to the driving voltage for generating an output signal and positively feeding back the output signal to the input of the amplifier device" (col. 3, lines 30-36 and col.5, lines 22-32).

However, Noro does not specify:

- that the device responding to the feedback gain control is a voltage controlled amplifier

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- that the feedback gain decreases as the level of the control signal increases
- that the adjustment of the amplifier-frequency characteristic is only adjusted when it exceeds a critical level, and is otherwise constant

Bonneville discloses an overload protection circuit for a negatively driven loudspeaker. The device comprises both a main feedback loop and a feedback loop for adjusting a voltage controlled amplifiers (22,24) (col. 3, lines 29-44 and 57-62). Regarding **Claim 1**, the rectifier (44), the threshold amplifiers (46,48), and the charging circuits (50,52) are used to control the output gain of the adjustable amplifiers (22,24) (col. 3, lines 57-67 and col. 4, lines 1-3). The use of voltage controlled amplifiers to respond to the feedback control signal, which provides function parallel to that of the multiplier of the system of Noro, reads on "a voltage-controlled amplifier having the variable feedback gain" as well as other references to such a component in the claims. Regarding the operation of the threshold and control circuits, Bonneville teaches that, under normal circumstances, the control signal is equivalent to zero, and the amplification of the voltage controlled amplifier is at its maximum level (col. 4, lines 36-41). When the threshold levels are surpassed though, the control signals (C1,C2) begin to increase, causing the gains of the respectively connected voltage

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controlled amplifiers to decrease in order to prevent the output amplifier (16) from reaching a clipping level (col. 4, lines 45-56). This functioning reads on "the voltage controlled amplifier decreases the variable feedback gain as a level of the control voltage increases" and "only if the level of the control voltage exceeds a critical level, and otherwise keeps the variable feedback gain constant".

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to incorporate the overload protection, voltage comparison scheme of Bonneville into the positive feedback, impedance compensation circuit of Noro. The motivation behind such a modification would have been the overload protection that the arrangement of Bonneville would have provided to the system of Noro, which already involved gain compensation procedures based on the use of a feedback loop. Such an inclusion would have simply enhanced the use of the signal information obtained in the feedback loop, thereby improving the quality of the output signal being provided to the amplifier and speaker in the combined system.

Regarding **Claim 2**, the rectifier (44) that receives the driving voltage of the loudspeaker (10) reads on "a detector that detects the signal corresponding to the driving voltage in terms of a load voltage of the loudspeaker". A charging circuit (52) converts the output of the threshold amplifier (48) into a voltage that is used to control the adjustable amplifier (24) (col. 3, lines 65-67 and col. 3, lines 1-20). Bonneville also

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discusses the use of a digital signal processor (DSP) instead of threshold amplifiers and charging circuits, in which case the output of the DSP would have been received by a D-to-A converter (col. 5, lines 51-57). The charging circuits (50,52) and the proposed D-to-A converter both read on "a converter that converts the detected load voltage to a control voltage".

Regarding **Claim 4**, the system of Bonneville employs two threshold devices wherein one threshold is set higher than the other (col. 4, lines 8-20). The second threshold level, implemented through the use of a threshold amplifier (48), is set near to the clipping level and its corresponding charging circuit is designed to have an output that rapidly decreases the gain of amplifier (24). The control voltages provided by these amplifiers (46,48) and their respective charging circuits (50,52) output control voltages (C1,C2) that increase upon the surpassing of the respectively associate thresholds, causing the gain provided by the voltage controlled amplifiers (22,24) to decrease (col. 4, lines 45-56). This reads on "the voltage controlled amplifier decreases the variable feedback gain as the level of the control voltage increases". As is shown by the various levels illustrated in Figure 2, this prevents the level of the output signal from reaching a clipping voltage, which reads on "thereby preventing an output of the amplifier device from clipping".

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Response to Arguments

3. Applicant's arguments with respect to claims 1, 2, and 4 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Graham whose telephone number is (703) 308-6729. The examiner

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can normally be reached on Monday-Friday (7:30-4:30), excluding alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Isen, can be reached at (703) 305-4386. The fax number for the organization where this application or proceeding is assigned is 703-872-9314 for regular communications, and 703-872-9315 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Andrew Graham
Examiner
A.U. 2644

ag
November 18, 2003



MINSUN OH HARVEY
PRIMARY EXAMINER